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The Evolution of Network-based Business Models Illustrated Through the Case Study of an Entrepreneurship Project

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Abstract

Purpose: Existing frameworks for understanding and analyzing the value configuration and structuring of partnerships in relation such network-based business models are found to be inferior. The purpose of this paper is therefore to broaden our understanding of how business models may change over time and how the role of strategic partners may differ over time too.

Design/methodology/approach: A longitudinal case study spanning over years and mobilising multiple qualitative methods such as interviews, observation and participative observation forms the basis of the data collection.

Findings: This paper illustrates how a network-based business model arises and evolves and how the forces of a network structure impact the development of its partner relationships. The contribution of this article is to understanding how partners positioned around a business model can be organized into a network-based business model that generates additional value for the core business model and for both the partners and the customers.

Research limitations/implications: The results should be taken with caution as they are based on the case study of a single network-based business model.

Practical implications: Managers can gain insight into barriers and enablers relating to different types of loose organisations and how to best manage such relationships and interactions

Originality/value: This study adds value to the existing literature by reflecting the dynamics created in the interactions between a business model's strategic partners and how a how a business model can evolve in a series of distinct phases

Keywords: Network-based business models, stakeholders, strategic partners, longitudinal case study
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Introduction

In the near future, when markets are expected to become truly globalized and where technological developments potentially will enable even micro-companies to tap into global supply chains with great ease and flexibility, and where the same companies have the ability to reach global consumers and business-to-business marketplaces through the Internet, established companies will need to understand new ways of collaboration in order to sustain their businesses. The overall trend clearly points towards more collaboration between organizations (Gulati & Gargiulo 1999). In such a setting, the ability to create profitable network-based business models will become ever more crucial.

The ongoing global financial crises illustrates that in a global business cycle downturn, companies tend to focus on cutting their costs to a minimum, in turn reducing key resources and activities in their respective business models. Inevitably, such cost-cutting exercises will result in restrictions to the value proposition for customers. However, imagine the case where creating a network-based business model leads to both lower unit costs and a higher value proposition seen from the perspective of the customers. It is the objective of this longitudinal case study to understanding how partners positioned around a business model can be organized into a network-based business model that generates additional value for the core business model for both the partners and the customers. The ability to create such a structure ought to be the primary objective of any network-based business model in order to outweigh deficiencies such as lacking control, trust and inefficiencies.

In most cases when a company cuts it cost-base, take for example an airline carrier, it will have an impact on the service-level provided to the customers. Routes may be closed, flight-frequency reduced, service desks in local airports closed, in-flight service reduced etc. and all of these factors have a very direct impact on the value proposition towards the customer. In a recent contribution, Rindova *et al.* (2012) identifying three mechanisms linking partnering portfolios in strategic entrepreneurial networks that have an impact on firm growth: 1) configuring partnering portfolios to pursue distinctive logics for sourcing external resources, 2) aligning resource-sourcing and resource-linking logics in new product development, and 3) embarking on different growth trajectories, which contribute to different performance patterns. Hence, it is an interesting proposition to study whether new network-based business models factoring in openness, peering, sharing, and global positioning, could enable the possibility of enhancing the value proposition while at the same time reducing costs through partnering. This article reports the study of a network-based business model with precisely this ambition.

In studying the development of a network-based business model, Eye in the Sky (henceforth EIS), from an explorative perspective, we are able to map out a number of phases over which the business model developed and the barriers and enablers related to each phase. The results of this longitudinal research project provide insight into the implications of collaborating on delivering value to customers from a network-based perspective and provide valuable insight into the interdependent innovation (Kleinbaum & Tushman 2007) from inter-firm perpsective. Furthermore, this research provides a strong theoretical contribution relating to the tools for analyzing, developing and optimizing business models, in that the study finds weaknesses in relation to properly understanding and modeling the value creation that takes place between existing business models in the form of strategic partnerships and transactions. This study accentuates previous studies in the field. In particular, we advance the findings of Demil and Lecocq (2010), who also consider business model evolution. While Demil and Lecocq (2010) are specifically concerned with the dynamics created by interactions between a business model's components, this study adds value by reflecting the dynamics created in the interactions between a business model's strategic partners.

The remainder of the paper is structured as follows: Section two provides theoretical insight into, and discusses the value configuration of business models while the subsequent section reviews the notion of modeling network-based business models. Section four accounts for the methodology and provides a description of the case, while section five illustrates the evolution of "Eye in the Sky" network. Finally, the results are discussed and related back to theory in section six.

Understanding the value configuration of business models

New types of value creation. We have heard that song before. In the mid 1990's there was an overflow of literature documenting how new types of value creation spawned several new fields of interest such as e.g. intellectual capital, networks and e-business as important "new" drivers of value creation (cf. Zott *et al.* 2011) in the wake of the dot.com era. However, neither intellectual capital, networks nor e-business are by themselves new types of business models. Rather, they represent important sub-elements of business models. Intellectual capital has e.g. become a greater part of competitive advantage, while networks and e-business represent choices for customer contacts and customer-targeting strategies respectively. Another way of denoting this is that the value configurations that companies apply to become successful have altered as Sweet pointed out already in 2001.

Our postulate here is that as new types of value configuration emerge, so do new business models. Therefore, new models and tools for working with the identification, analysis and development of value are needed in order to illustrate the effects of managerial decisions on value creation. Accordingly, managers must recognize that business models are made up of portfolios of very different resources such as networks, competences, customer loyalty, and not merely traditional physical and financial assets. Therefore, "every company needs to create a business model that links combinations of assets to value creation" (Boulton, Libert, & Samek 1997, 33).

The rising interest in understanding and evaluating business models (Nielsen 2011) can to some extent be traced to the fact that new value configurations are starting to outcompete existing ways of doing business. Already a decade ago, Sandberg argued that changes in the competitive landscape had given rise to a variety of new value creation models within industries where previously the "name of the industry served as shortcut for the prevailing business model's approach to market structure" (Sandberg, 2002; 3) and that competition was increasingly between competing business concepts (Hamel, 2000) and not between firms with different strategies. One attempt at defining what a business model is states that "A business model describes the coherence in the strategic choices which makes possible the handling of the processes and relations which create value on both the operational, tactical and strategic levels in the organization. The business model is therefore the platform which connects resources, processes and the supply of a service which results in the fact that the company is profitable in the long term" (ANON.). As such this idea correlates with Hamel's arguments and emphasizes that a business model is the platform, which enables the strategic choices to become profitable (see also Seddon *et al.* 2004).

Resources are often mentioned as central aspects in business model frameworks (Betz 2002). Klaila (2000) explains how the description of a business model helps, e.g. managers and employees, to identify the critical behaviors, competencies, and market conditions and account for the key resources that are present in the company. From such a resource-based perspective these resources are key inputs to the value creation process of the company (Boulton *et al.*, 1997). As it, for some organisations at least, can be rather complex to understand the roles of the many different resources in the total value creation of the company (Covin & Stivers, 1997), the business model approach becomes advantageous, because it, in the words of Miller, Eisenstat & Foote (2002) visualizes the capability configurations of the company, understood as the cohesive combination of resources and capabilities embedded within its infrastructure that generate value.

The value chain is a typical example of a value configuration. Porter defines the value chain as a tool for analyzing the sources of competitive advantage of the firm because "The value chain enables a systematic examination of all the activities a firm performs and how these activities interact" (Porter, 1985; p. 33). Every firm is essentially a collection of interdependent activities that are performed to create value. According to Shank and Govindarajan (1992) the value chain is "the linked set of value-creating activities all the way from basic raw materials to the ultimate end-use product delivered into the final consumers' hands" (ibid., 179).

Within the notions of business models, the value chain is argued to comprise the activities and organization

of the company (Hedman & Kalling 2003) and the structure of the company (Alt & Zimmermann 2001). In Bell *et al.*'s (1997) client business model framework for example, core business processes and activities, and the analysis hereof, are also viewed from a value chain perspective. Likewise, Chesbrough & Rosenbloom (2002) imply that the value chain perspective leads to the identification of the activities and assets (inputs) that are necessary to deliver the value proposition of the company (outputs).

However, there are alternative value configuration models to that of the value chain. Stabell & Fjeldstad (1998, 414) suggest that the value chain is but one of three generic value configuration models. Based on Thompson's (1967) typology of long-linked, intensive and mediating technologies, they define the value chain as a value configuration that models the activities of long-linked technology. Stabell & Fjeldstad (1998) argue that the distinction between these three generic value configuration models is the key to being able to analyze firm-level value creation.

Sweet (2001) identifies four strategic value configuration logics: value-adding, -extracting, -capturing, and -creating and argues that it is the ability to manage these logics well, rather than the ability to create new business models that leads to sustainable success. By stating this, he confirms the necessity of understanding how the business model and its value creating elements work, as a prerequisite for managing the company. Ramirez (1999) too, offers an alternative view to that associated with value creation in industrial production, arguing that technical breakthroughs and social innovations in actual value creation render the alternative, a so-called value co-production framework.

The first of the two alternative generic value configuration models proposed by Stabell & Fjeldstad (1998) is the value network logic. It models firms that create value by facilitating a network relationship between their customers using a mediating technology, e.g. like an infomediary or innomediary, as Sawhney *et al.* (2003) explicates. The second alternative to the value chain is the value shop logic. It concerns firms where value is created by mobilizing resources and activities to resolve a particular customer problem. Hence, both of these value configuration logics have significant similarities to our network-based business model setting.

This discussion naturally leads us to the field of networks, which has rendered much attention in recent years (cf. Castells 2000) and network analysis in order to frame an understanding of network-based business models. A network consists of specific roles and value interactions oriented toward the achievement of a particular task or outcome (Allee, 2008). Despite the fact that there has been a significant amount of attention directed towards understanding the role of interorganizational networks and alliances (Gulati 1998) and for example which contingencies that affect the success or failure of a relationship, (cf. Batonda & Perry, 2003; p. 1), very little attention has been directed towards the evolution of networks (Anderson et al., 1994; Håkansson & Snehota, 1995).

Batonda & Perry (2003) describe three schools in relation to network evolution: stage-theory, state-theory and joinings theory. The stage-theory contains two main theories: life cycle models and growth-stages models (Batonda & Perry, 2003; 1458), both focusing on how inter-firm networks gradually develop through sequential stages, and over a period of time (see also Ford, 1980; Van de Ven, 1992). State-theory comes from a different school of thought, and is in opposition to the sequenciality thoughts on which stage-theory is based. Instead, state-theory suggests that actors in a collaboration move randomly from one state to another (Anderson et al., 1994; Håkansson & Snehota, 1995). Joining-theory is more centered on what happens at the beginning of a network and how the entry has a major influence on the further development of the network (Thorelli 1986, Batonda & Perry 2003). This could for example be the case when the way in which partners are identified and recruited has an influence on the outcome of the network.

Batonda & Perry (2003) conclude that companies that are new in network settings often tend to think of the collaborations as following a sequence of stages, while more established companies or companies that are network-based themselves tend to accept the approach of the state-theory. Finally, Batonda & Perry (2003) argue that joining-theory is not applicable when focusing on inter-firm network development. This

study will utilize these experiences when conducting the research, but before outlining the specific use, it is necessary to describe the context of network analysis.

According to Lazzarini, Chaddad and Cook (2001), network analysis is based on the recognition that network structure constrains and at the same time is shaped by firms' actions (Granovetter, 1973; Nohria, 1992), and provides a series of techniques to map out the structure of interorganisational relationships. Lazzarini *et al.* (2001) introduce the concept of *netchain analysis*, which provides a framework, which is able to encompass the value-shop and value-network configurations of Stabell and Fjellstad (1998) and thereby constitutes a viable framework for analyzing network-based business models. A netchain analysis explicitly differentiates between horizontal (transactions in the same layer of the value chain) and vertical ties (transactions between layers), mapping how agents in each layer are related to each other and to agents in other layers (Lazzarini *et al.*, 2001; p. 7). The framework distinguishes between three types of interdependence in the network, namely sequential, pooled and reciprocal each of which spurs distinctly different types of value creation sources.

Allee (2008) argues that in order to facilitate the analysis of the value of a network, knowledge and intangible value exchanges must become an integrated part of the models applied in visualizing value configurations along side that of information, physical and monetary transactions. Even if network analysis is becoming more and more important, only few studies have contemplated how the intangible resources of companies interact to create value for the whole network (Allee, 2008; Solitander and Tidström, 2010; Peng, 2011; ANON.).

In the words of Zott and Amit (2009), business models go well beyond traditional views on network theory and emphasize the inclusion of factors such as purpose, acceptance, fairness, coherence and viability. Our synthesis here is therefore that the business model constitutes a value creation "core" based on the interaction of a number of generic building blocks (cf. Chesbrough, 2006; Osterwalder & Pigneur 2009), and that it is embedded in a network of partners and alliances that contribute to value creation through supplying resources or performing activities and that these partners are not only restricted to interacting on the traditional value chain perspective, but can perform downstream customer activities and even core value proposition enhancing activities. This is much in accordance with Zott and Amit (2010), who argue that a business model is a system of interdependent activities that transcends the focal firm and spans its boundaries and that the activity system enables the firm, in concert with its partners, to create value.

The process of designing network-based business models

One way of visualizing a business model is through the Business Model Canvas, a conceptual tool developed by Osterwalder & Pigneur from ca. 2003 to 2009 (Osterwalder & Pigneur 2009). The Business Model Canvas describes a business model as being based on nine interrelated building blocks where the centrally placed value proposition links the infrastructure of the company (down-stream activities) with the customer (distribution and after sales relationships).

Osterwalder & Pigneur's work (cf. Osterwalder 2004, Osterwalder, Pigneur and Tucci 2004; Osterwalder and Pigneur 2009) has provided a popular framework for describing, understanding and developing business models. This is primarily due to the fact that the canvas is an intuitively applied template from which to discuss the "how's" and "why's" of the activities and choices made by a company in order to achieve a sustainable position in their industry. The model does not prescribe any particular starting point for the analysis, or any particular order of discussion. Rather, it prompts the user(s) to focus on natural connectivities between the nine building blocks that make up the model. Osterwalder & Pigneur (2009) propose a process of applying the canvas to describe the "as-is" model of the organization, and thereafter to focus on strengths and weaknesses and finally try to narrow down potential "could-be's" and evaluating this business model innovation in a SWOT-like manner. A limitation to the framework is the static nature of the business model canvas, in view of the desire to generate new innovative business models.

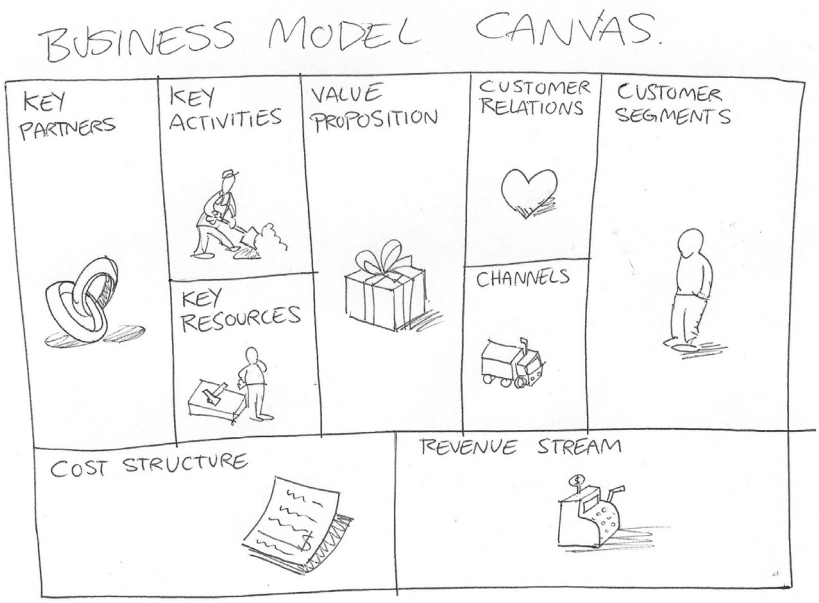

Figure 1: The Business Model Canvas

Furthermore, the Business Model Canvas framework encounters limitations in cases where several companies and individuals form a network in a new business model. There seems to be a need to develop an additional layer to the framework for each partner (stakeholder) and for the network at a whole so that it may encompass the network of partners and alliances that contribute to value creation through supplying resources or performing activities as described in section 2 above. A network-based business model is a business model where two or more, and often several, stakeholders create a joint value proposition or jointly affect a value proposition based on the key activities and resources of all stakeholders. The partners are not only restricted to interacting in a traditional value chain manner i.e. sequentially (Lazzarini *et al.* 2001), but can perform downstream customer activities and even core value proposition enhancing activities.

A company's ability to tap into and again tap out of these networks, interorganisational relationships and processes and its ability to innovate across the network capabilities that present themselves; will become a competitive advantage in itself. The notable success of several innovative network-based business models in recent years ,such as Apples network of App-companies and Groupon's success with merging sellers and buyers, supports the notion of including business partners in the design and innovation process of business models. Network-based business models may be constructed in a variety of ways. Below we provide a number of examples that illustrate this.

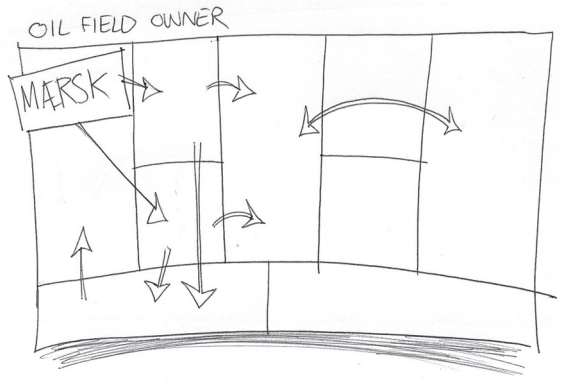

Figure 2: Partners can influence value creation

A network-based business model in the context of the Business Model Canvas (Osterwalder and Pigneur 2009) seems to lack an additional layer to capture the network dimension. The Business Model Canvas it self contains a building block entitled "network partners" enabling the user to identify who the key partners and suppliers are, which resources they are providing and which activities they perform. In the Business Model Canvas, the partners have a direct effect on the key resources and activities affecting the cost structure of

the company. If we take the example of an oil driller that offers owners of oilfield to develop, drill and produce oil they become a key partner in the business model of the oilfield owner. Figure 2 illustrates that the oil driller provides key resources; pioneering technologies, experienced personnel and machinery. They can implement key activities; preforming all tasks in drilling and processing the oil affecting the cost structure and the value to the customers in the oilfield owner's business model.

In this case the Business Model Canvas describes how the use of partners affects the value creation delivered to the customers. In other words it describes how partners or suppliers interact with the case company's business model. It can be argued that the above example is a network-based business model, hence, two or more partners affect the value proposition based on the key activities and resources of all stakeholders. In the case above, it is the oilfield owner's business model that is at the core and the Business Model Canvas provides a good platform for understanding the key attributes of their business model. In another type of business model, two or more companies may pool their resources and activities into a joint business model providing a joint value proposition for the customer as illustrated in figure 3.

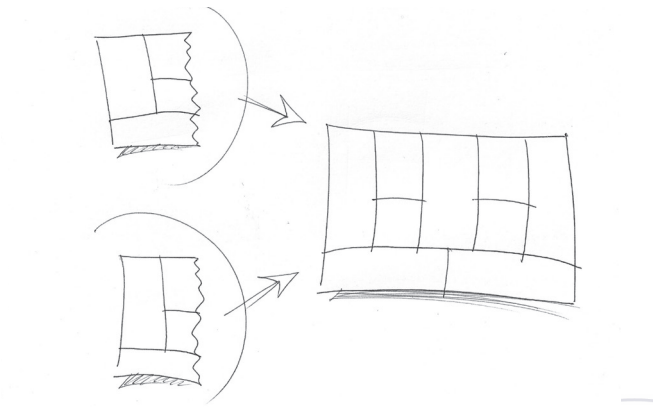

Figure 3: Partners as substitutes on the back-end business model

Such a setup occurs in various contexts like for example joint ventures, business collaborations, co-branding of products etc. In such cases, the limitations of the Business Model Canvas become clear in the context of describing network-based value creation. The Business Model Canvas does not provide a detailed enough description of the actions and relationships occurring between the stakeholders, nor the financial structure and risk between the stakeholders.

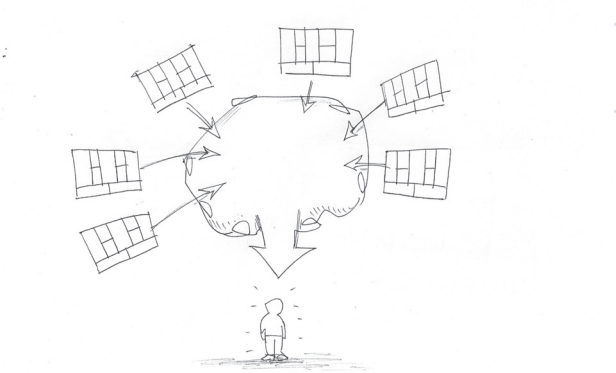

Figure 4: Several business model add value

A third example of a network-based scenario is the "equal partnership model" where two or more partners (in figure 4 exemplified by six Business Model Canvasses) add relevant core resources and activities into a joint business model creating a new "pure" network-based business model. These brief examples indicate a potential weakness of the Business Model Canvas when it comes to treating partners in relation to network-based business models, because the partners are creating business models in the network relationship itself. Furthermore, it may be problematic for understanding value creation flows that some customers also can be treated as strategic partners.

The DNA of a network-based business model

We hypothesize that network-based business models can be structured in different patterns, much like the existing literature on singular business models denotes (cf. Osterwalder and Pigneur 2009). However, in the network-based setting the characteristics of the stakeholders and the structure between them define the stakeholder patterns and are a part of what might be denoted *the business model DNA*. In this DNA, the stakeholders are the companies, organizations and individuals that make up the core company's business model.

Methodology and case description

Methods

In this section a case study is introduced to illustrate how a network-based business model arises and evolves and how crucial the awareness of the dimension of *multiple collaborators* is for the creation of a new business model. A Danish research program "International Center for Innovation" (ICI) was initiated in 2007, ending in March 2013. The project aimed to inspire and assist participants in a development process of innovating new network-based global business models and in providing a solid base for relevant qualitative data, parallel to a business and industry ambition of creating sustainable business models for the companies involved. The collaborating companies were structured into networks consisting of at least 5 companies. Each network was followed for at period of at least two years. ICI has since 2007 followed and documented the development of 10 network-cases including a total of 92 companies that were in the process of understanding their business model with the ambition to innovate their existing business models to become new global network-based business models.

The case study presented in this article is based on a longitudinal case study over a period of 3 years of a Danish start-up called Sky-Watch and its network partners in the ICI project called Eye in the Sky (EIS). The network of companies and individuals behind Core Company developed a new business model for drone helicopters. Sky-watch has about 20 employees and has an annual turnover of an estimated € 10 million.

The longitudinal study of EIS was a longitudinal interventionist research project (Lukka 2005) which was combined with a series of non-interventionist type semi-structured interviews (cf. Yin 2003). The research group mainly followed the whole network, including the founders of Sky-Watch, the CEO and senior staff from the company, as well as selected partners, consultants and researchers. The project had a defined goal to globalize its drone helicopter product. During the research project, there have been numerous meetings, workshops, reports and semi-structured interviews, which are recorded and/or documented with minutes, pictures or video. The terminology of the business model was introduced to all participants, and especially the use of the Business Model Canvas (Osterwalder & Pigneur 2009), and narratives exemplifying existing, successful business models.

The evolution of "Eye in the Sky" network

The following is an account of how the Eye in the Sky (EIS) network evolved through a series of phases. This case study illustrates how the business models of the related companies affect one another and how they form the value creation of the core company. The Eye in the Sky (EIS) network was one of the first projects in ICI and is a remarkable example on how a new business arises from a network of companies supported by a public innovation program. From the start in the ICI project, it was the assumption that the ideal network pattern for a network-based business model would follow the structure of a so-called "partner business model" figure 1, where it was hypothesized that at least five partners added their core resources and activities into a joint business model creating a pure network-based business model.

This ideal network pattern was the platform for founding a new network based business model that in the case of the "Eye in the Sky network" evolved in a number of network stages providing us significant data showing how the network dimension evolves in stages.

Phase 1. The birth of a new network based business model

The Eye In the Sky network was initiated by Access2Innovation, a research program situated at Aalborg University with the aim of bringing together NGOs, universities and private companies in a triple helix construction, in order to contribute with a series of innovative solutions for the work done by relief organizations in third world countries. In the spring of 2008, five companies were invited to take part in a project working with a product development idea at the Department for Automation and Control at Aalborg University. The idea was originally identified by DanChurchAid's Humanitarian Mine Action group, a Danish NGO.

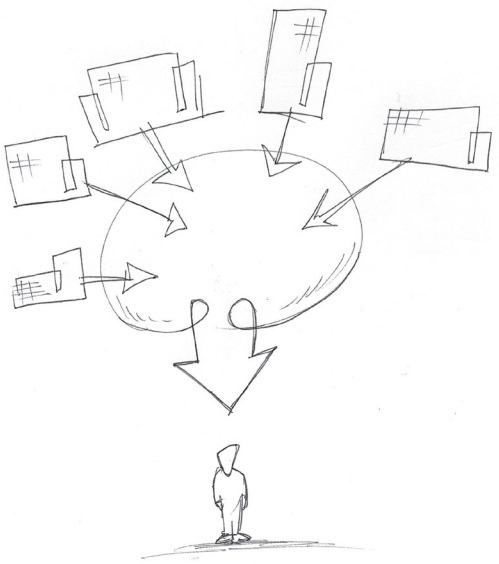

Figure 5: The partner business model

The starting point of the dialogue was an autonomous mine-seeking drone helicopter developed at Aalborg University. DanChurchAid had vast experience in landmine seeking and landmine removal, and could therefore provide knowhow. Relatively quickly they rejected the sustainability of the idea because their experience told them that such areas often were often prone to heavy competition. They instead identified a need for aerial photography to map out areas and creating an automated overview. These data are often outdated or not existing for landmine-infested areas in developing countries.

Combining the idea of an airborne mine-seeker and the demand for areal photos spawned the idea of a small versatile unmanned drone helicopter, which could take the required aerial photos of the minefields. With the project defined, the notion of a pure network-based business model was initiated by identifying which key resources and activities were necessary for developing, producing and manufacturing the drone helicopter.

This led to the gathering of 5 partners; **Mekan** contributing with mechanical competences, essential to manufacturing the first prototype. **Danish Aerotech** having competences on the manufacturing of mechanical, structural and electrical components for airplanes and the design of these. Additionally, they had experience with airplane and helicopter maintenance, and provided especially the mechanical knowledge and the maintenance of flying units had relevance to the project. **GomSpace** worked on components for satellites and the control hereof, offering knowledge on power source for the drone. **NetImage** had expertise delivering web-based solutions within e-trade, e-service and digital billing, and had therefore competences within data control and data-structure, along with competences within construction of the user interfaces to be utilized in the control of the helicopter. **SpaceCom** had knowhow in the field of satellite communication and radio connections, which were vital for the communication between the control-unit and the helicopter, and for controlling the geo-referencing of the picture material. **DanChurchAid** was, as mentioned, providing the demand for the product, and therefore constituted the reference customer for the drone. As such they were treated as a partner too, because of their ability to provide knowhow on the customer value proposition needed.

The five companies all had a natural interest in the project because their individual contributions were similar to what they were doing in their existing businesses, and at the same time not competing with their existing market. Furthermore another motivation was that the financial crises had started kicking in, and all of the involved companies were experiencing tougher times due to a downturn in the business cycle. This added to the interest for the project and the expectation of getting development activities fully funded by ICI was welcomed. This led to the start of the development of a prototype of the drone, and during this work it became clear that in order to lift the project each and every partner would have to commit to investing part of his or her own capital too. In this phase of the network, we identify elements of the problems that Zott and Amit (2007) encounter in relation to the counterproductive problems when entrepreneurs attempt to incorporate both efficiency- and novelty-centered design elements into their business models.

Phase 2. A Shake and Bake setup

The project was left in a critical state because the partners started losing interest in it. This was primarily due to the fact that they had been given the impression that

the development would receive full external funding via the ICI project, which was a misunderstanding. After a period of standstill, one of the employees started raising money for the project on his own. As the project was in a seed phase, only few funding opportunities were available. However, he managed to convince his father to invest and at the same time involved a local business incubator as a source of syndicated funding. This led to the registration of a separate company, Sky-Watch A/S.

The partners were still relevant to the project of developing a drone helicopter, but only a one of them was willing to invest money in the project. Therefore, the network making up the business model changed from the pure network model to what could be defined as a shake a bake setup (fig 6).

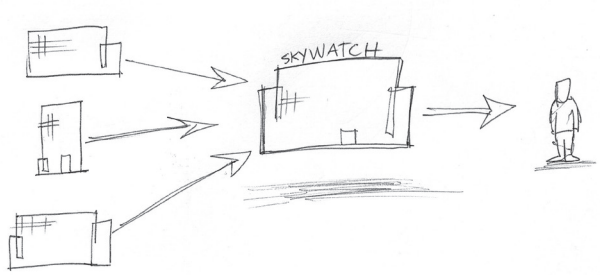

Figure 6: The shake and bake model

The shake and bake setup differs from the pure setup by having an entity that is the project owner, and that only assembles the ingredients from the other partners, combining their resources and activities into the final product. An ideal shake and bake setup is owned by all or most of the relevant stakeholders making up the business model or the stakeholders have some other significant incentive committing them to the project. In this case the "non owning partners" were still committed to the project through the anticipation of receiving a subsidy for product development, alternatively creating a potential customer for their existing business. This phase is identical to Zott and Amit's (2009) conception of a network-based business model, where there is a focal firm at the core of the network.

Phase 3. A "normal" business model

Most "normal" business models replicate the structure of the value chain, and thus consist of a central company that buys raw materials and components etc. from suppliers and where external stakeholders interact and affect the business model through relationships and monetary and physical transactions.

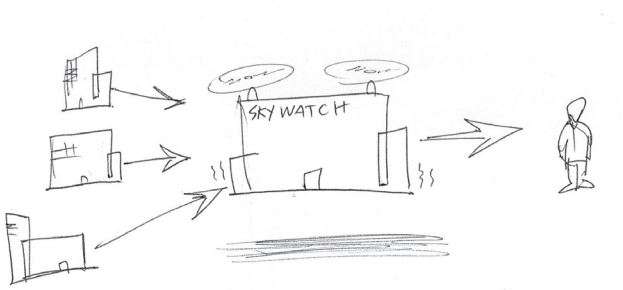

Figure 7: The normal Sky-Watch business model

Sky-Watch A/S was developing more and more into a separate company, devaluing the retention of its partners' stakes in the. Due to its organic growth, Sky-Watch started experiencing limitations in relying on its original partners, their technology and knowhow and identified the need of starting their own R&D department, which took place in the summer of 2010. This led to a regular break with the shake and bake setup.

On the one hand, Sky-Watch experienced problems in relation to their original partners' ability to deliver on time, which made it difficult to coordinate development and production. Most importantly, the software/hardware solution previously employed was very difficult to configure to the original purpose with the drone. This was in part due to a poorly managed database, along with inflexible hardware. Sky-Watch realized that in order to build a profitable business, they needed to be able to access several different customer segments. This in turn required them to take control on the central hard- and software competences, in order to produce a solution that was flexible enough to be quickly adapted to new market segments. Concurrently, this would also

increase the value of the firm, as they would come to possess a range of vital product competences within their field.

Many of the electrical components were bought off the shelf, while central circuit boards were designed in-house and subsequently made to order from suppliers. The manufacturing of the shell was to be handled by suppliers, based on the blueprints from Sky-Watch. Yet, the demand for rapid prototypes and the unreasonable costs associated with small batch productions later led the company to acquire a 3D printer. This was in part used to manufacture prototypes, but also to produce special parts for limited batch productions.

This entailed a large substitution of partners in and around the business model. With the control system in-house, Gomspace became largely redundant, yet collaboration with this partner continued on various shared components. NetImage proved not to possess the necessary competences for designing a user interface for a helicopter, as this required significant knowledge on how a helicopter operated. Furthermore, Mekan proved less relevant, as a larger part of the new design was to be in plastic. Danish Aerotech continued as a central partner, as they worked within a non-competing product in a similar segment. In that respect, Danish Aerotech had significant insights into the legislation within the field, while Sky-Watch could provide them with insights into a new interesting market segments. DanishChurchAid also continued as a partner, as they maintained an interest in the products and could help introduce Sky-Watch to the NGO segment. In that respect, they proved a valuable partner, by actively pushing the story of the collaboration to the press. This generated some attention towards the project, which in turn provided legitimacy, which could be used towards military and other commercial segments.

As such, the network encompassing Sky-Watch was structured in such a manner that it was consistent with the changed structure and purpose of the firm. In that respect, a new network was configured based on the more value-chain based approach, in which Sky-Watch would carefully choose which activities were essential to the company, and which were best served by outsourcing.

Phase 4. The channel partnership

As the drone moved closer to a commercial product ready for the market, Sky-Watch began looking thoroughly into the sales possibilities on the NGO market. This proved significantly difficult to penetrate, as NGO's typically do not contain the means to make investments. Any investments are typically brought in through sponsorships of specific projects. This meant that the lead-time would be very long and wrought with uncertainty. Furthermore, sales to the UN-system required suppliers to have an established sales record, along with inventory stock and other resources, which Sky-Watch, at the time, simply did not possess. As a consequence, the firm began uncovering the possibilities for serving other segments, especially focusing on industrial inspection and military usage. In that respect, the company continued to emphasize a network approach, by searching for potential partnerships with organizations that had existing distribution and sales channels in those segments. Therefore, we denote this the "The Channel partnership" phase. This resulted in a partnership with a stakeholder that opened to sales and a service organization to the global market.

Phase 5. Moving towards a Platform-based business model.

In our work with Sky-Watch we introduced the idea of a "platform business model". This is a business model where the product becomes a platform for new business models and at the same time provides value for existing customers. An example of a successful platform is Apple's products. When Steve Jobs back in 2010 introduced the Ipad he showed us a new product and at the same time manifested their business model as being a digital supermarket. In the process of working with the Apple-metaphor the company began uncovering more application possibilities, which emphasized the potential of the product. Through talks with different agents in different business segments that could be related to the drone helicopter, many different possibilities surfaced. However, each and every one of these different application possibilities would require specialized equipment beyond the current camera functionality.

This made Sky-Watch realize that fulfilling this business potential would be extremely difficult. They would have to develop or purchase specific components and

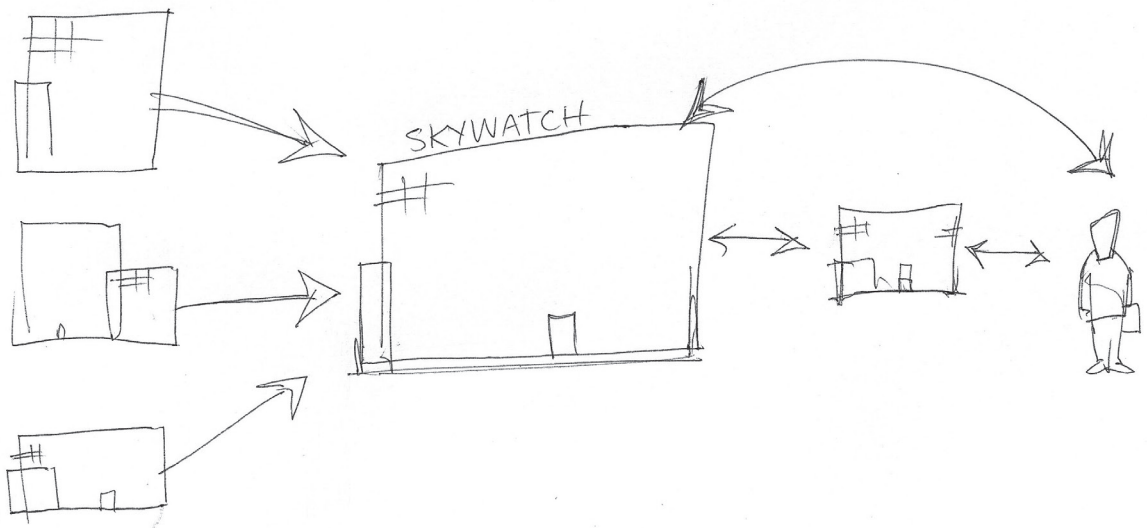

Figure 8: The channel partnership

integrate the necessary data treatment processes, associated with areas which they were not competent in. The solution was a new business model developed in collaboration with ICI. The helicopter was to be considered a basic unit, which contained different possibilities for attaching other components. Thereby, the functionality could be extended significantly. On the product level, this meant that the helicopter was to contain new functionalities, which would enable the unit to send data back to the control station along with the ability to control the attached equipment.

In that respect, Sky-Watch changed character. From having been a company focused on visual documentation through a camera, this functionality became a subcomponent in the guidance of the helicopter, on to which other components could be attached. In that respect, the firm created a platform where the possibilities would be highly dependent on the application possibilities developed by other partners. This enabled Sky-Watch to overcome the limitations they previously operated under, in relation to spreading the product to new segments. This would just require them to find the right partners to develop the application possibilities.
The context for this is also that Sky-Watch began reconsidering what constituted their core competencies. Rather than only considering themselves to be a development company specialized within UAV helicopter solutions, they realized that their competences were not necessarily specific to helicopter drones. Rather, it was the actual control of autonomous units that was their core competence. This indicated that the control and guidance competences of the firm could be applied to other units, for example drone submarines. Yet, the helicopter solution remained the core product, which was to drive the firm forward. This necessitated that the product was finished, manufactured and distributed. As such, the firm had laid out the groundwork for a two-sided business model, in which one targeted selling control and guidance competences, while the other targeted the helicopter solution. In order to build profitability, the firm chose to focus specifically on the helicopter solution, by building production capacity and distribution network for the helicopter specifically. Through this platform-based business model, Sky-Watch was able to turn potential competitors into customers, thus replicating one the three ways companies can compete through their business model (Casadesus-Masanell and Ricart, 2011).

Discussion and concluding remarks

The empirical section above is a detailed elaboration of the implementation process of a new network-based business models. It illustrates the involved entrepreneurs managed the uncertainties they were confronted with in their innovation process through five consecutive phases. Most importantly, it illustrates how the changes in network configuration over the five depicted phases challenge the existing frameworks for generating and analyzing business models. Particularly the application of the Business Model Canvas (Osterwalder and Pigneur 2009) and how it incorporates the relationships between stakeholders and their respective impacts on each other's value creation and value configurations are advanced.

Through the research conducted on the 10 network-based business models constituting the ICI project, several start-up business models have been analyzed. Initial evidence suggests that they often have a very poor overview over the relationships between the activities performed, the necessary resources, and how to configure the involvement of partners in their business model. The Sky-Watch case study presented in this article suggests that the entrepreneurs' ability to understand the business model and the ability to manage the network-evolution pattern are key success factors. Sky-Watch's success is particularly due to their ability to adapt the business model continuously and to understand and coordinate activities, resources, and how partners became involved in value creation.

In the first phase of the EIS network, the network of stakeholders took the form of a pure network. Here the core business model becomes a fusion of actors' activities, resources and partners. In the initiation phase they had not taken a position on the future form of the company but rather focused on how the stakeholders could create a joint product. The association/glue between the partners was a potential project financing, whereby the individual stakeholders would get subsidized for product development. When reality showed a more complicated financing structure, the network gradually dissolved. At the same time the stakeholders kept sympathy for the project they themselves had helped to set up, which meant that the "new company" Sky-Watch could create a shake and bake model where they were able to capitalize on the goodwill from the initial stakeholders.

In the ICI project three networks that attempted to maintain a network-based business model in a pure form with a varying number of key stakeholders. However none have been successful. Among the key problems is that it is difficult to create an ownership model and it is difficult to find projects where stakeholders are able to mix their existing business models to something new, without the new business models potentially interfering, hurting or directly cannibalizing their existing business.

Sky-Watch established itself initially as a Shake and bake setup. It enabled them to have access to resources and activities through the involvement of committed stakeholders. This simultaneously reduced the need for a number of costly resources such as know-how, production equipment and technology, at the same time reducing the need for capital. The shake and bake setup enabled them to successfully create proof of concept and gain access to additional financing. Finally, through the platform-based business model implemented in phase five, Sky-Watch were able to turn potential competitors into customers, thus replicating the mantra of Casadesus-Masanell and Ricart (2011, 8) who exclaim that the ability to build complementarities with rivals' cycles can result in substitutes turning into complements. This is precisely what Sky-Watch had succeeded in doing.

When juxtaposed to Stabell & Fjellstad's (1998) three types of value configurations, the Sky-Watch case illustrates how the network evolves from a value shop configuration to a value network configuration over the five network phases. This is surprising, as the pure network form starting out in phase one and the platform-based business model form ending in phase five each lend themselves more naturally to the opposite. The explanation is perhaps that the explorative nature of the network in phase one has a higher impact on the choice of value configuration. However, part of the explanation in this case study is the way in which the partners were joined and the particularities of the network partners, including their objectives for entering the initial research project. One might ponder if this

company had existed at all today if there had not have been a misunderstanding as to how the finance and subsidy structure at the beginning of the project was set up? As such this study touches upon the missing focus on networks in entrepreneurial contexts identified by Stuart and Sorensen (2007), who argue that a disproportionate quantity of research focuses on the consequences of networks at the expense of research on their origins.

The Sky-Watch case likewise shows us how a new network-based business model is implemented and legitimated through the application of storytelling about successful metaphors of doing business – in our case the platform-based business model applied by Apple and Groupon. The development of new interdisciplinary networks like for example Apples, however, contains a number of barriers and challenges going forward - both for businesses and for researchers. A significant paradox is, that although network-based business models have the potential to become vital catalysts of value creation through by becoming a hub for innovation and development of global business models, very few companies are potentially "leveraged" to practice the innovation of business models in networks. It goes without saying that companies are "handicapped" by their corporate culture and not least their "learning culture" which is typically characterized by hierarchy, "single business model thinking,", planning, and push and pull economy. It may require an entirely new knowledge set to cope with the "multiple collaboration" and "multi-business model" economy (see also Lindgren, Taran & Boer 2010). However, it is not enough to be able to get the ideas and concepts for new business models "merged" together - but it is also necessary to act on them commercialize them quickly, globally - and thus to different markets. As such, this article also contributes to understanding the institutional factors both favoring and impeding the emergence and success of network-based business models. The success in this particular network-based business model lies in the ability create multiple collaboration, by Rindova *et al.* (2012) denoted configuring partner portfolios.

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